

# BDCP Refinements Respond to Community and Statewide Needs

August 2013

Proposed refinements have been developed to address comments and concerns gathered throughout the BDCP planning process.

Over 7 years, hundreds of public meetings, and ongoing coordination with stakeholders, a comprehensive plan to address the ecosystem and water supply challenges in the Sacramento-San Joaquin Delta has taken shape. The Bay Delta Conservation Plan (BDCP) has continued to evolve since the enactment of the 2009 Delta Reform Act. The water facility and conveyance operations proposed as part of the BDCP have changed significantly in ways that reduce disruption and disturbance in the Delta. Changes previously announced include:

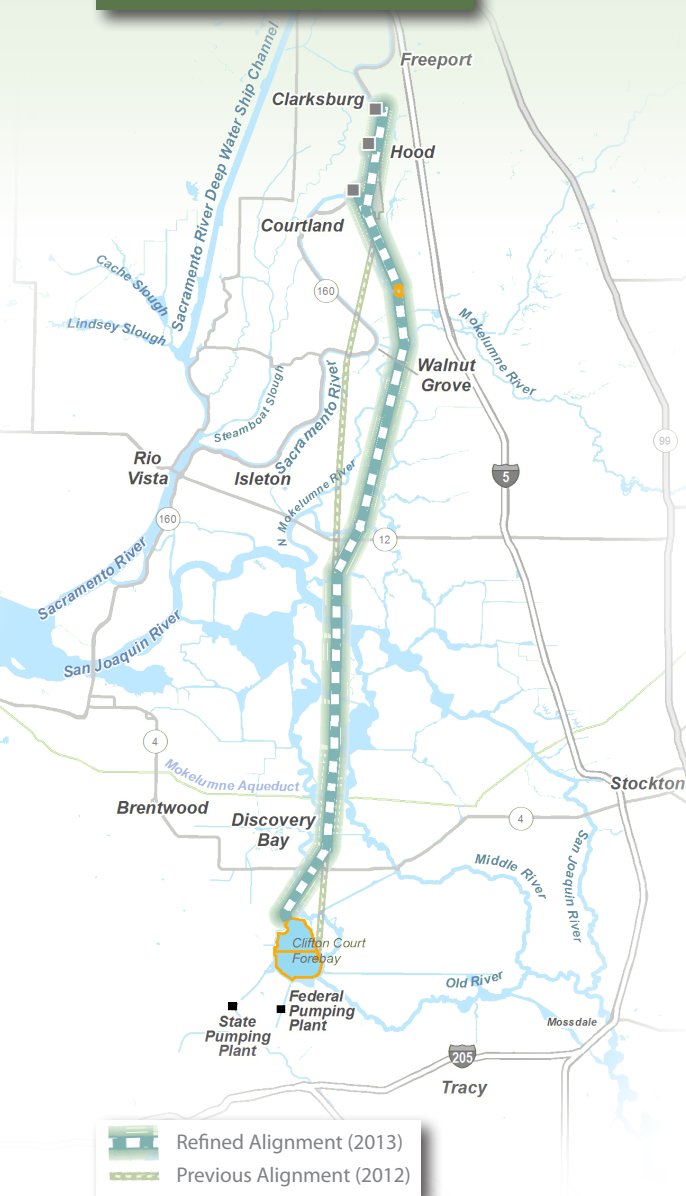
- Underground tunnels, instead of a surface canal, could be used for water transport.
- The number of new Sacramento River intakes has been reduced from five to three, and capacity has decreased from 15,000 cubic feet per second (cfs) to 9,000 cfs.

Newly proposed changes include:

- A shift of construction activities associated with intermediate forebay and reusable tunnel material area away from north Delta communities.
- A shift of some permanent and temporary construction impacts from private to public lands.
- A shrinking of the intermediate forebay surface acreage from 750 acres to 40 acres.
- A reduction in the number of main tunnel shaft locations from seven to five.
- Shortening of the main tunnel length from 35 miles to approximately 30 miles.
- A reduction in the amount of private land subject to permanent and temporary impacts due to construction of water conveyance infrastructure.

These project refinements balance costs, engineering design, and ease of construction while minimizing local dislocation and disturbance.

Efforts will continue to ensure that the project is developed under the best management practices possible, and with the most current science available. The plan seeks to achieve the co-equal goals of a more reliable water supply for California and enhancement of the Delta ecosystem, while also preserving the unique communities and agricultural productivity of the Delta.



*No final decisions on the BDCP can be made prior to the completion of environmental review and public input. The elements described here have been identified for the purpose of further analysis pursuant to the California Environmental Quality Act, the National Environmental Policy Act, the Endangered Species Act, the Natural Community Conservation Planning Act, and other applicable statutes.*

Highlights of Changes to Proposed Water Facility Construction

Recent tunnel alignment refinements based on local input and ongoing evaluation have been recommended to improve efficiency, reduce impacts to local Delta communities, and minimize environmental impacts. These changes will be reflected in the BDCP Measure 1 and evaluated in the Public Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) planned for release in 2013.

Reduced Impacts of Recent Project Refinements<sup>1</sup>

	Consultant Administrative Draft EIR/EIS	2013 Project Refinements (Environmental Review Pending)
CM 1 Facility Footprint <sup>2</sup>	3,654 acres	1,851 acres
Intermediate Forebay Size (Surface Acreage)	750 acres	40 acres
Private Property Impacts – Permanent and Temporary	5,965 acres	5,557 acres
Public Lands Utilized	240 acres	657 acres <sup>3</sup>
Number of Main Tunnel Launch and Retrieval Shaft Locations <sup>4</sup>	7	5
Agricultural Impacts <sup>5</sup>	6,105 acres	6,033 acres

<sup>1</sup> All acreages listed are approximate. Final acreages will be determined after the Record of Decision/Notice of Determination. Environmental review documents are meant to disclose impacts. As such, the worst-case scenario impacts are included. Opportunities to further reduce and mitigate impacts will be evaluated as the project progresses.

<sup>2</sup> Conservation Measure 1 - All permanent surface facility footprint acreage. Does not include reusable tunnel material acreage.

<sup>3</sup> 2013 Project Refinements utilize more publicly-owned acres.

<sup>4</sup> A "Shaft Location" is defined as a location with one or more launch or retrieval shafts. Includes locations for the main tunnel, which is the dual-bore tunnels between the intermediate forebay and Clifton Court Forebay.

<sup>5</sup> Agricultural impacts were identified using the County Land Use data, which includes the following categories: Alfalfa, Corn, Fallow and Idle, Grain, Grapes, Non-irrigated, Deciduous Fruits and Nuts, Field Crops, Truck (Nursery and Berry), Pasture, Rice, Semi-Agricultural, and Tomatoes.

**Uses More Public Lands** – The refined alignment utilizes 657 acres of state- and publicly-owned property to minimize impacts to productive farmland and beneficial habitat. The Department of Water Resources property south of the town of Hood will be used as a construction staging area, and due to its proximity to town, a 1,200-foot noise buffer will be provided (included in the EIR/EIS as a mitigation measure).

**Reduces Roadway Impacts** – Input from the local residents of Hood and Courtland identified several temporary road alternatives for Highway 160 that preliminarily meet Caltrans requirements and impacts fewer residences, other structures, and farmland. DWR will continue its consultations with Caltrans to further refine the road designs to address community concerns, including the accommodation of emergency response vehicles, agricultural vehicles, and other commercial vehicles. The refined alignment also reduces or eliminates impacts to bridges and roads including the Snodgrass Slough Bridge at Twin Cities Road and Highway 4.

**Reduces the Impact of the Intermediate Forebay** – Operational changes to gravity flow conveyance and modification at Clifton Court Forebay allow for the reduction in size of the Intermediate Forebay surface storage and spillway from more than 1,000 acres to less than 250 acres (with surface acreage reduced from approximately 750 acres to 40 acres). Relocating the smaller forebay away from the towns of Hood and Courtland and closer to Interstate 5 on the Glanville Tract also lessens the impacts to roads and bridges, creates conservation opportunities with the Stone Lakes National Wildlife Refuge, and makes it possible to utilize more publicly-owned land.

**Creates Reusable Tunnel Material** – The refined tunnel alignment includes the potential for reuse of excavated tunnel material. Lessons learned on a nearby San Francisco Public Utilities Commission tunnel project suggest that as much as 98 percent of the material will be reusable for construction, habitat restoration, and other reuses. The EIR/EIS assumes that all of the excavated tunnel material will need to be stored; however, with modern sorting and processing techniques using biodegradable additives, the majority of the material is expected to be reused during and after the construction of the project.

**Eliminates Borrow Pit Area Near Intakes** – Proposed borrow pits in the area near the intakes (between River Road and Snodgrass Slough) have been removed. Due to concerns about drainage and irrigation impacts on farmland, activities in this area will be limited to staging for construction. Overall acreage of the staging area will be reduced in half from more than 400 to approximately 200 acres.

**Reduces Height of Pumping Plants** - Design refinements allow for the reduction of the height of the pumping plants at the intake facilities along the Sacramento River from 60 feet to approximately 30 feet.

**Reduces Above-Ground Impacts to Hood** - Replacing the proposed cut and cover (surface) pipeline with a conveyance tunnel reduces impacts to the town of Hood, including the Hood fire station, homes, farmland, and related structures.

**Increases Habitat Restoration Opportunities** – The combined actions of realigning the conveyance tunnels and moving the intermediate forebay creates new restoration opportunities. Excavated reusable tunnel material creates the opportunity to work with landowners and stakeholders to improve and preserve habitat at potential locations like Staten Island both for sandhill cranes and other species.

**Reduces Impacts in South and Central Delta** – The tunnel realignment has reduced the number of tunnel reaches and the number of launch sites. Some islands no longer have direct impacts, including Venice, Andrus, and Tyler islands. Impacts elsewhere have been reduced significantly.

**Modifies Clifton Court Forebay** – Clifton Court Forebay will be redesigned to improve overall operations for both north and south Delta conveyance. The existing forebay will be dredged, divided, and expanded to the south. Proposed north Delta conveyance facilities will supply water to the northern portion of the forebay, while existing south Delta facilities will supply the southern portion. The new pipeline-tunnel will terminate at the north end of the forebay. Additionally, opportunities have been identified to expand recreation facilities and accessibility at Clifton Court.

Refined Alignment (2013)  
Previous Alignment (2012)

No final decision can be made prior to the completion of environmental review and public input. Final alignment will be based on further stakeholder input to minimize impacts.

Counties, cities, and other local governments depend, in part, on property taxes paid by private property owners. Typically, when land is acquired by a public agency, those payments stop. To ensure that these important revenues remain, the BDCP will pay the replacement cost of those property taxes to local governments.

## Moving Forward: Ongoing Community Coordination and Adaptation

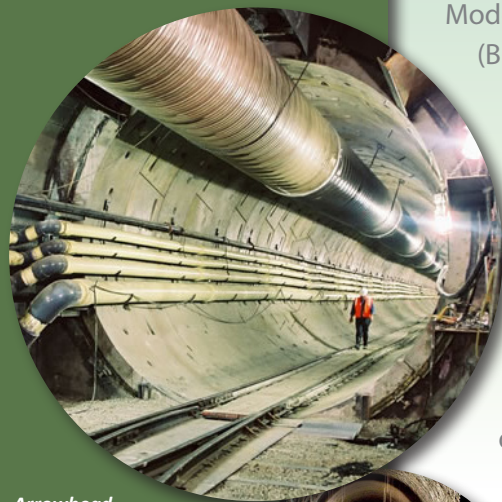
The State of California is committed to an open and transparent process throughout the development of the BDCP, as reflected by refinements made to BDCP's water and ecosystem strategies over the past several years. Opportunities for public involvement continue, with the Public Draft BDCP and EIR/EIS scheduled for release in 2013.

Delta Landowners may contact DWR Delta Landowner Liaison Lauren Bisnett at (916) 653-7564 or [lauren.bisnett@water.ca.gov](mailto:lauren.bisnett@water.ca.gov) with questions about the Consultant Administrative Draft environmental documents, now available online at [www.BayDeltaConservationPlan.com](http://www.BayDeltaConservationPlan.com).



August 2013

# Incorporating Proven Tunnel Technology and Reuse of Excavated Material



*Arrowhead  
Inland Feeder*



*Hetch-Hetchy/  
San Francisco Bay Tunnel*

Modern tunnels, such as those proposed for the Bay Delta Conservation Plan (BDCP), rely on highly advanced technology. This advanced technology has proven successful in the design, construction, and operation of tunnels in the United Kingdom, France, Japan, China, Mexico, New York, and California. Currently, the State Water Project (SWP) operates more than 15 miles of tunnels in California.

Proposed Delta tunnels would be excavated using a circular cutterhead that mines through the soil at approximately 150 feet below the surface. While no two tunnel projects are exactly alike, BDCP tunnels, and the specialized contractors building them, would utilize modern technologies developed from past projects with similar features, such as length, depth, diameter, and construction conditions. Water and biodegradable, eco-friendly soil conditioners are mixed with the soils to create a toothpaste-like material that is easily transported to the surface via conveyor belt or rail car. This excavated material will be tested and evaluated to determine suitability for various reuse options. "Reusable tunnel material" can then be transported to the opportune reuse location and use.

BDCP is evaluating numerous options for the reuse of excavated tunnel material to reduce local impacts from the proposed construction of water conveyance facilities, and would put the excavated material to beneficial use. Material excavated during construction, often referred to as "tunnel muck" (currently identified as reusable tunnel material), has been identified for many possible reuses, including strengthening levees, raising subsiding Delta islands, and restoring natural habitats, among other uses. While tunnel material has been successfully reused for various purposes around the world, the California Department of Water Resources (DWR) is currently performing tests to ensure the feasibility and safety of reusing this excavated material.

*No final decisions on the BDCP can be made prior to the completion of environmental review and public input. The elements described here have been identified for the purpose of further analysis pursuant to the California Environmental Quality Act, the National Environmental Policy Act, the Endangered Species Act, the Natural Community Conservation Planning Act, and other applicable statutes.*

## Uses and Location of Reusable Tunnel Materials

Reuse of excavated tunnel material is expected to reduce impacts to locations within Delta communities previously identified as “tunnel muck disposal sites.” Reuse of tunnel material will be evaluated in the Public Draft Environmental Impact Report/Environmental Impact Statement (to be released in 2013). As part of the analysis of the refined project, potential reuses and locations have been identified. DWR is currently conducting laboratory tests and studies to ensure the suitability of excavated tunnel material for the reuses listed below:

- **Habitat Restoration** – Reuse of excavated tunnel material for habitat projects will contribute to the approximately 145,000 acres of habitat restoration and protection identified in the BDCP. Tunnel material may be used to reverse Delta island surface subsidence and to create conditions beneficial to migratory birds, including greater sandhill cranes.
- **Levee Improvements/Flood Mitigation** – Tunnel material could be used to strengthen Delta levees identified for maintenance and repair.
- **Structural Fill** – Materials have potential use as structural fill for construction of conveyance facilities.

### Case Study – San Francisco Public Utilities Commission

As part of a broad Water System Improvement Program, a 5-mile-long tunnel is under construction beneath the San Francisco Bay to update aging infrastructure transporting water to San Francisco and other parts of the Bay Area. The San Francisco Public Utilities Commission began construction of the tunnel in 2010 with a 15-foot-diameter tunnel boring machine. Of the nearly quarter-million cubic yards of excavated material, more than 98 percent has been reused for restoration of nearby sites, including the United States Fish and Wildlife Service’s Bair Island Restoration and restoration of a private quarry site. Tunnel excavation was completed in early 2013, approximately 6 months ahead of schedule, and no excavated material remains at the staging area near the Dumbarton Bridge.



*Photo courtesy of San Francisco Public Utilities Commission, Bay Tunnel project.*

# BDCP: Expanding Sandhill Crane Habitat

August 2013

The Bay Delta Conservation Plan (BDCP) includes conservation actions for 57 plant and wildlife species, including the greater sandhill crane, believed to be one of the world's oldest bird species. Thousands of sandhill cranes winter in the Delta, roosting in shallow wetlands and foraging on nearby farmlands. Because the cranes forage almost entirely on privately-owned agricultural lands, expanded efforts to protect these lands are essential to ensure that suitable habitat remains available in the Delta.

The BDCP seeks to restore and protect approximately 145,000 acres of habitat during its 50-year term. These restoration efforts include biological goals and objectives to address the needs of migratory birds, including the greater sandhill crane.

The BDCP Biological Goals and Objectives for greater sandhill crane have been updated based on proposed project refinements to include higher habitat targets than those appearing in previous drafts of the Biological Goals and Objectives.

Additionally, avoidance and minimization measures are included in the BDCP to reduce indirect effects, including:

- Maintaining flooded corn fields and optimizing management of lands in the vicinity of indirectly affected crane roosting/foraging habitat, prior to and during construction, to encourage cranes to remain in the vicinity.
- Restricting the timing and location of construction-related activities in the vicinity of roost sites during the winter, when cranes are present.
- Placing barriers between construction activities and crane roost sites to reduce both noise and visual effects.
- Locating power lines and other facilities to minimize effects on cranes.

## New Tunnel Route: Preserving Crane Habitat

Proposed refinements to the water conveyance facilities and tunnel alignment have been introduced based on a comprehensive review and analysis to balance costs, engineering design, and ease of construction while minimizing local dislocation and disturbance. The combined actions of realigning the conveyance tunnels and moving the intermediate forebay create additional restoration opportunities.

The refined water conveyance alignment includes an overall reduction of approximately 330 acres in the loss of permanent and temporary sandhill crane roosting/foraging habitat compared with the previous proposed alignment. BDCP implementation will result in a net permanent gain of 504 acres of roosting/foraging habitat, with at least 180 acres of new habitat in the Stone Lakes National Wildlife Refuge Project Boundary. While BDCP will result in a 4 percent permanent loss in crane foraging habitat, the value of crane foraging habitat on protected lands is expected to increase substantially. The net increase in roosting habitat, and the increase in area and value of protected foraging habitat are expected to protect and expand crane populations within their winter range in the Plan area.

In coordination with local Delta landowners and stakeholders, additional refinements will continue to be considered to avoid and minimize impacts to crane habitat.

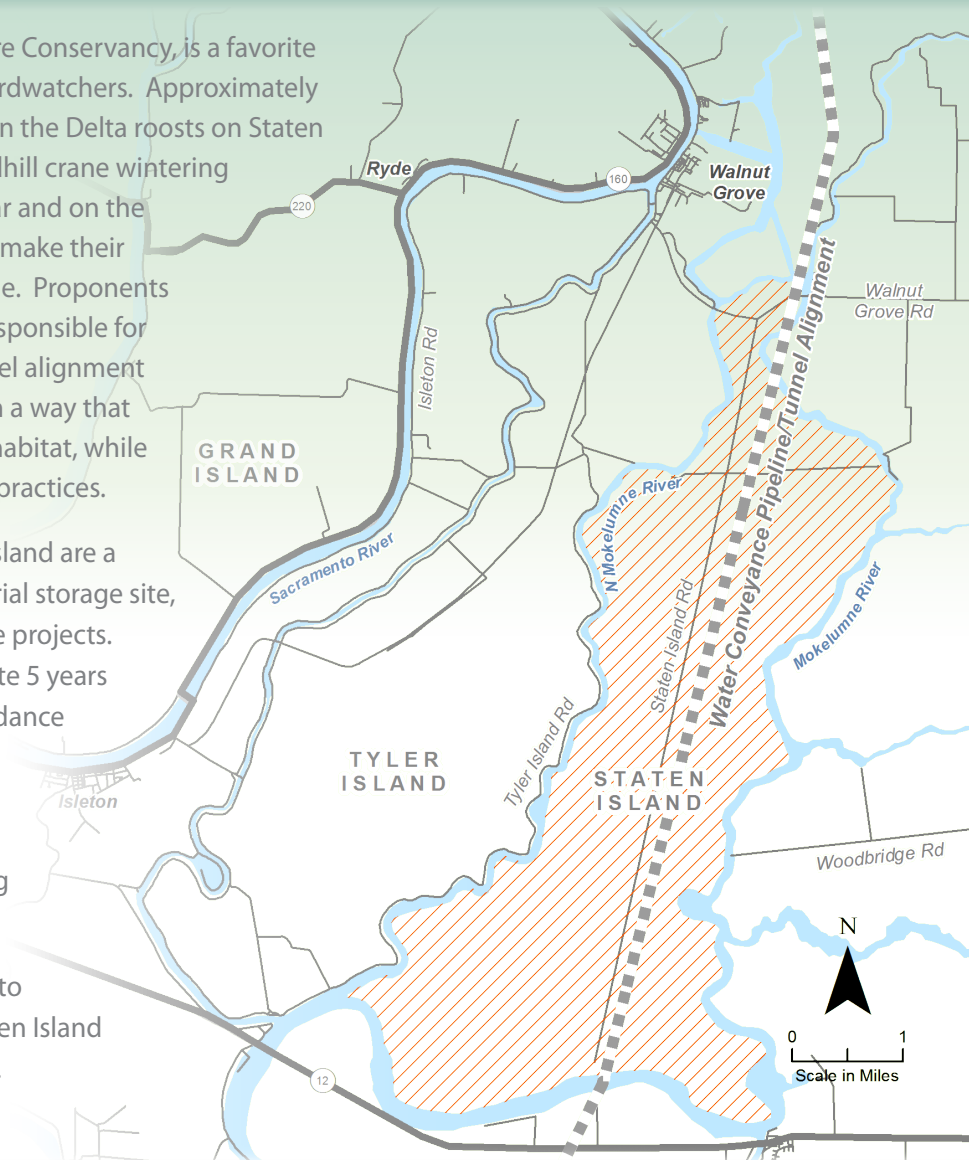


## Staten Island: Protecting a Special Place

Staten Island, owned and managed by The Nature Conservancy, is a favorite stop for sandhill cranes and a popular spot for birdwatchers. Approximately 20 percent of the crane population that winters in the Delta roosts on Staten Island, making it one of the most important sandhill crane wintering sites in the North Delta. The public roadways near and on the island are popular spots for watching the cranes make their daily return to nests from fields where they forage. Proponents of the BDCP intend to work closely with those responsible for the welfare of Staten Island to create a final tunnel alignment plan and manage construction and operations in a way that minimizes disruptions to roosting and foraging habitat, while protecting and enhancing bird-friendly farming practices.

Among the potential project impacts to Staten Island are a construction shaft and a 1,274-acre tunnel material storage site, which could be reduced through proposed reuse projects. While construction impacts are expected to create 5 years of temporary disruption to existing habitat, avoidance and minimization efforts and expanded habitat included in the BDCP's habitat restoration conservation measures are expected to result in a long-term net benefit to sandhill crane roosting habitat.

Additionally, BDCP is working with stakeholders to identify potential roadway modifications on Staten Island to enhance public access to crane-viewing areas.



*No final decisions can be made on BDCP prior to the completion of environmental review and public input. Final alignment will be based on further stakeholder input to maximize agriculture productivity and minimize impact to migratory bird habitat, including sandhill crane habitat.*